

# Daniil Markelov

## Deep Reinforcement Learning Game Development

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### ABOUT ME

I am a deep learning enthusiast, striving to bring intelligent systems into game development. I enjoy creating games and training deep reinforcement learning agents to play them. I believe that games make great environments for reinforcement learning research because of the variety of possible tasks and the relative cheapness of development, training, and deployment.

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### EDUCATIONAL BACKGROUND

#### Advanced Diploma in Game Development

Centennial College

The program covered all aspects of game development in Unity, and I put emphasis on learning C# and deep reinforcement learning. During my studies, I took part in various game jams and projects, which taught me the practical aspects of game development.

#### Deep Reinforcement Learning Nanodegree

Udacity

We started with tabular methods and the basics of dynamic programming and then moved on to DQNs and PPO. It was a lot to cover in such a short time, and this program inspired me to keep looking into the topic on my own.

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### PROFESSIONAL EXPERIENCE

#### Game developer / Programmer

Comet studios (2020 – 2022)

- Developed collectibles and equipment systems, enemies, bosses, wave generation system and difficulty multiplier
- Collaborated with other programmers to create a general code architecture and support existing code systems
- QA, outlined the balancing direction and adjusted the difficulty of the game's progressing
- Tightly worked with a design team to implement their game vision and outlined tasks during agile processes and standups

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### PROJECTS

#### Space RTS Dots – AI and Gameplay

A multi-threaded multi-agent environment where hundreds of agents compete to survive in a battle-royale style game.

#### Fealty to the King – AI and Gameplay

A unique turn-based board game with a chess-RPG blend of rules. By using reinforcement learning and self-play, I developed and trained an agent to play against a player.

#### Doodle Jump – AI and Gameplay

Made to design and compare different perception systems for reinforcement learning agents and try out different training algorithms.

#### Dino – AI and Gameplay

Efficient decision-making for agents in continuous time environments.

#### Tools for ML-Agents – Programming

Streamlining the process of training and use of techniques similar to Population Based Training.

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### SKILLS

- C#, Python
- Unity, Unreal
- ML-Agents, Tensorflow, PyTorch, Scikit-Learn, RLlib, Stable Baselines
- Rider, PyCharm
- GitHub, Bitbucket
- Jira, Trello
- English, French, Russian